Beyond Handles: The Digital Object Architecture

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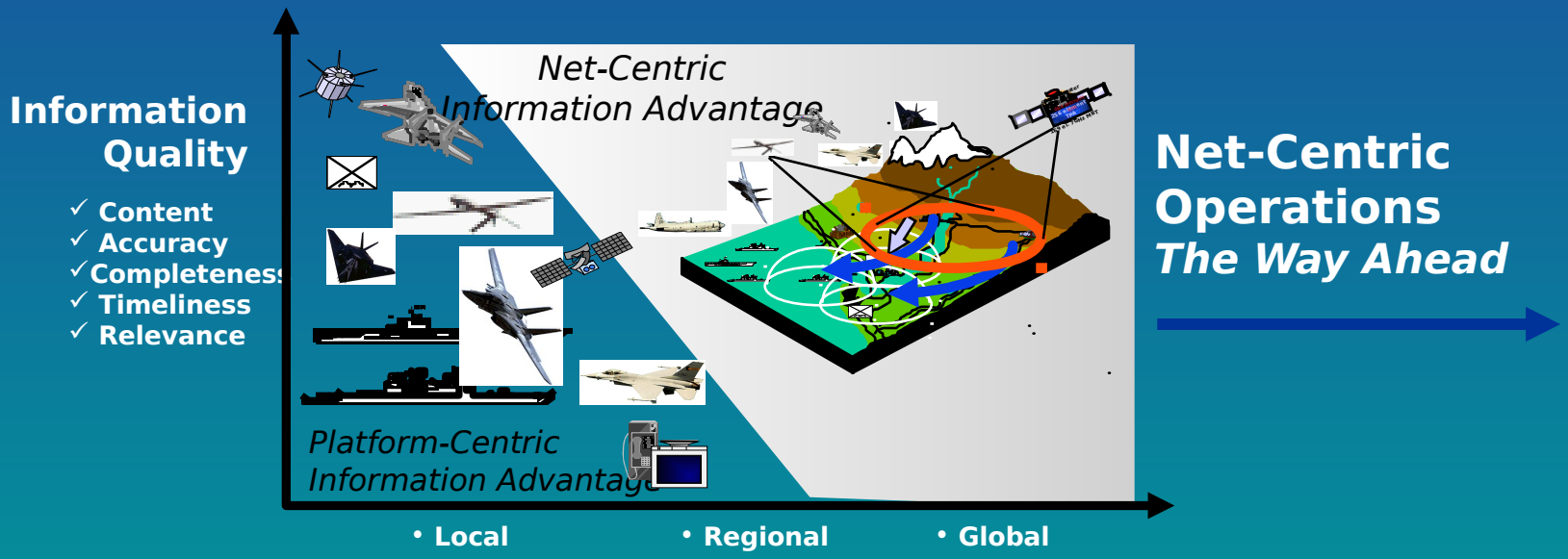
Defense Transformation

"The ***two truly transforming things***, conceivably, might be in information technology and information operation and ***networking and connecting things in ways that they function totally differently than they had previously***. And if that's possible, what I just said, that possibly the ***single-most transforming thing*** in our force will not be a weapon system, but ***a set of interconnections*** and a substantially enhanced capability because of that awareness."

Secretary Rumsfeld - Aug 9, 2001

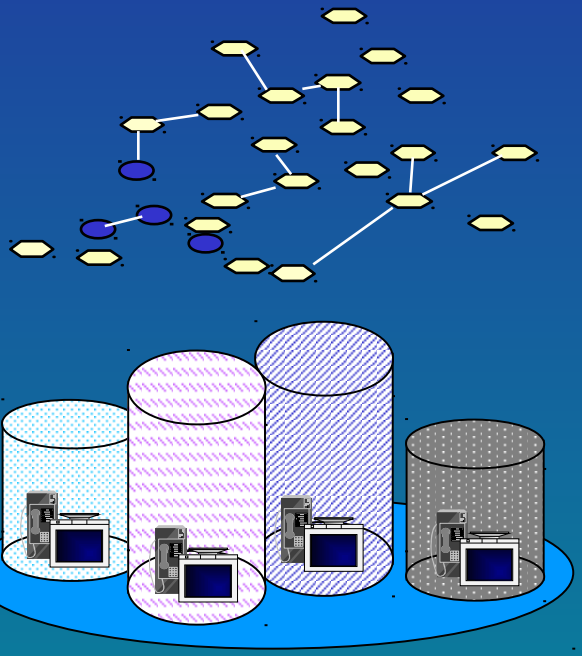


Source: Margaret Myers, Principal Deputy OSD DCIO

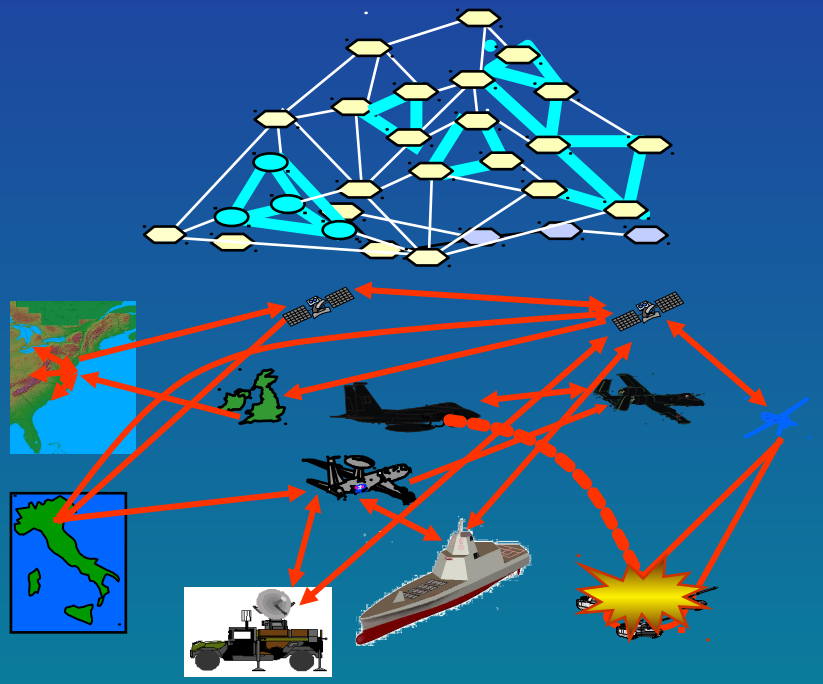
Net-Centric Operations

A Fundamental Shift

Platform-Centric



Net-Centric

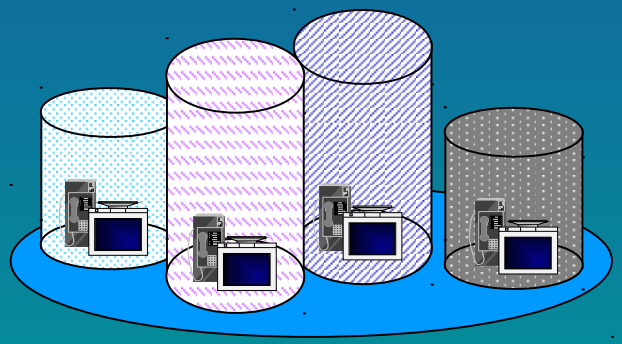


Traditional stove-pipe approach *v.* Fused information available on the Net

Source: Margaret Myers, Principal Deputy OSD DCIO

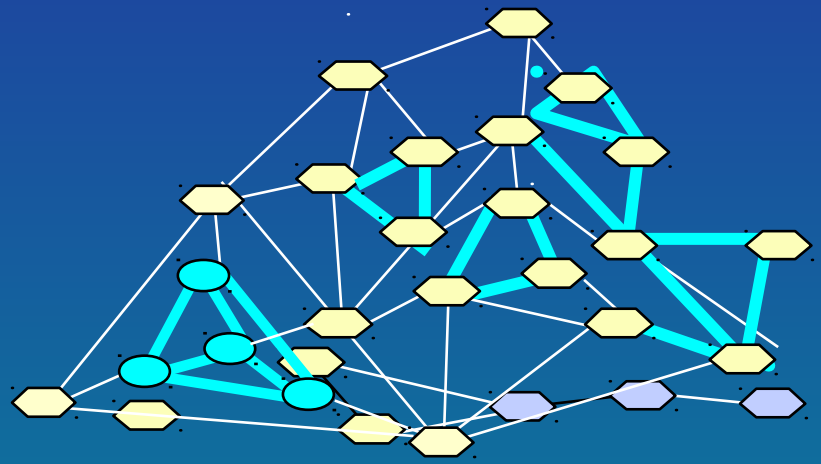
System-Centric, "Stovepipe" Architecture Problems

- Pre-web, client/server, terminal/mainframe paradigm
  - Content is typically application specific and relies on specific *systems and platforms* to provide access, access control, and presentation
  - Content is often not visible to the web, i.e. "Deep Web" problem
- Content lacks flexibility and extensibility. Difficult to to do versioning, dynamic creation, appropriate disseminations, and support intra/inter-organizational reuse or value-adding
- Content quickly becomes unauthoritative as it is downloaded and reused
  - Outdated
  - Insecure
- Architecture lacks coherent preservation strategy



What are the Characteristics of a Net-Centric Information Space?

- Content is:
  - **Persistent**
  - Visible
  - Authoritative
  - Extensible
  - Reusable
  - Interoperable across platforms
- Content supports:
  - Dynamic relationships
  - Value adding



Digital Object Architecture

- Network paradigm
  - Content is not application specific and does not rely on specific *systems and platforms* to provide access, access control, and presentation
  - Content can easily be made visible to the web
- Content is flexible and extensible
  - Lends itself to versioning, dynamic creation, appropriate disseminations, and intra/inter-organizational reuse
  - Supports the establishment of content relationships
  - Is networkable across system/organizational boundaries
  - Content remains authoritative as it is accessed and reused
  - Supports coherent preservation strategies

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Digital Object Architecture Components

Digital Objects

- Persistently identified
- Self contained
  - Self described
  - Self aware
- Integral access control
- Extensible

Repositories

- Contain digital objects
- Are, themselves, digital objects
- Repository Access Protocol (RAP)
- Platform independent

Handle System

- Persistent identification
- Distributed Architecture

Resource Discovery

- Search engines
- Databases
- Digital information
- Digital objects

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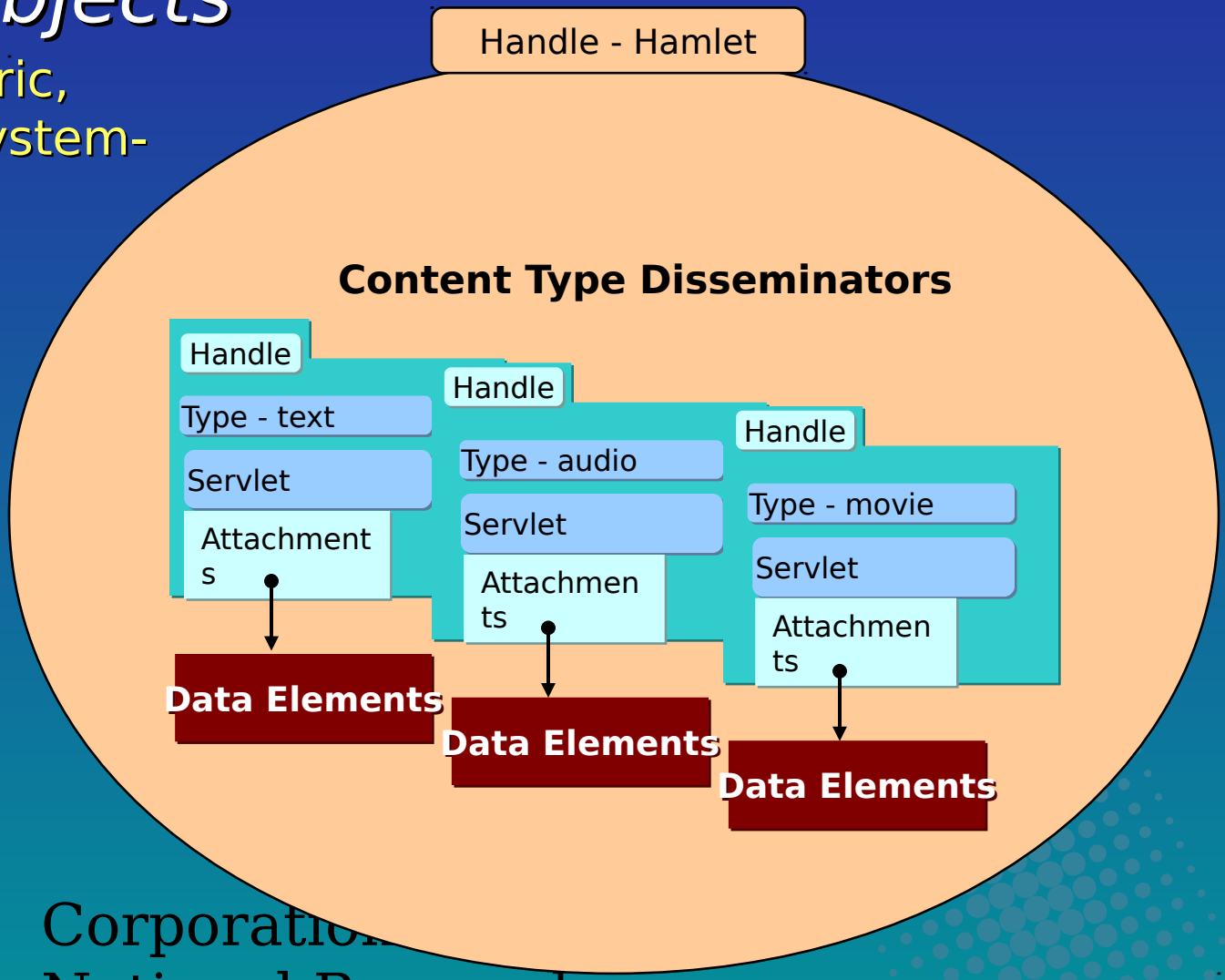
Digital Objects

Content-centric, instead of, System-centric



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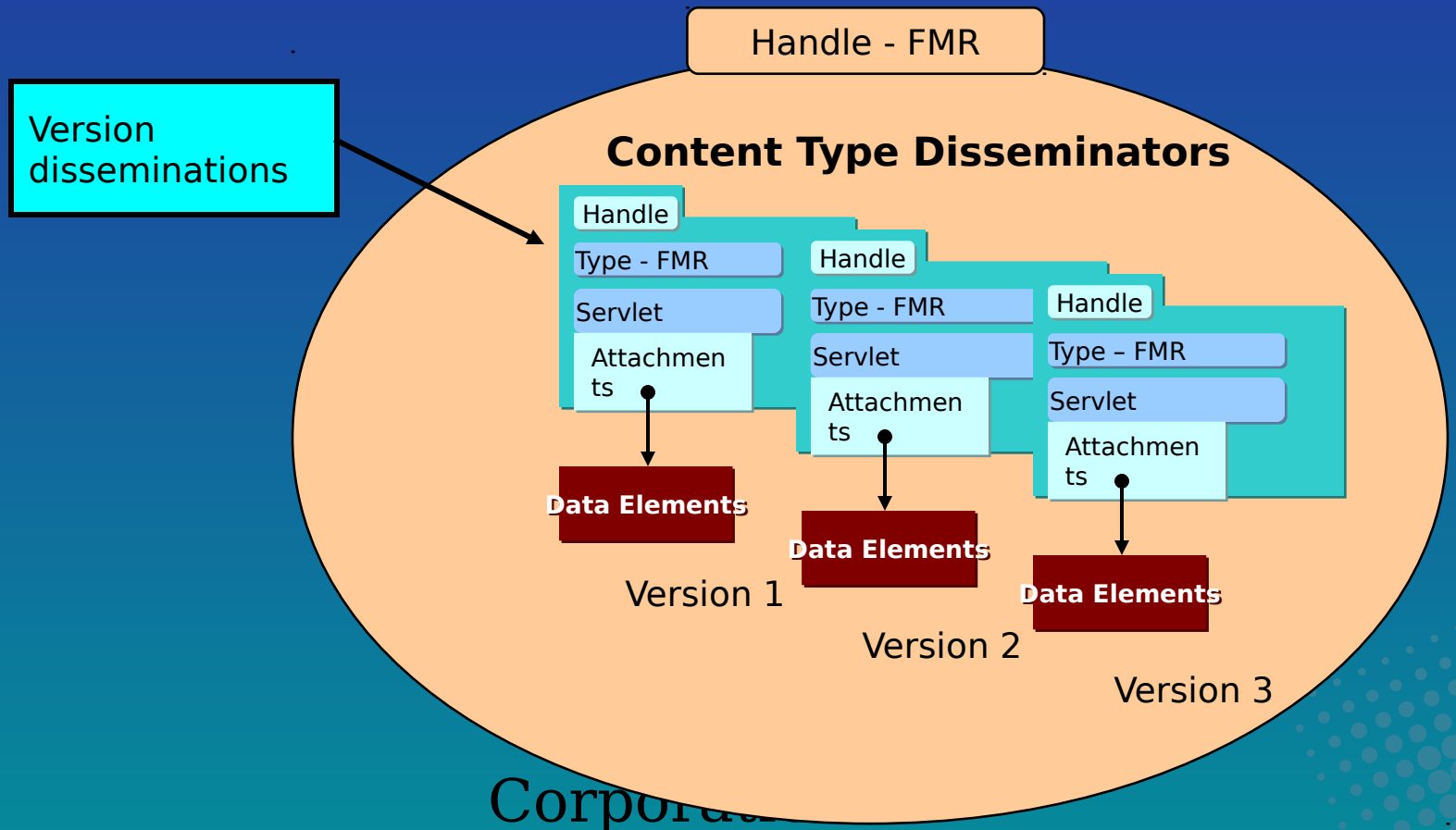
Digital Object Example: Federal Management Regulation



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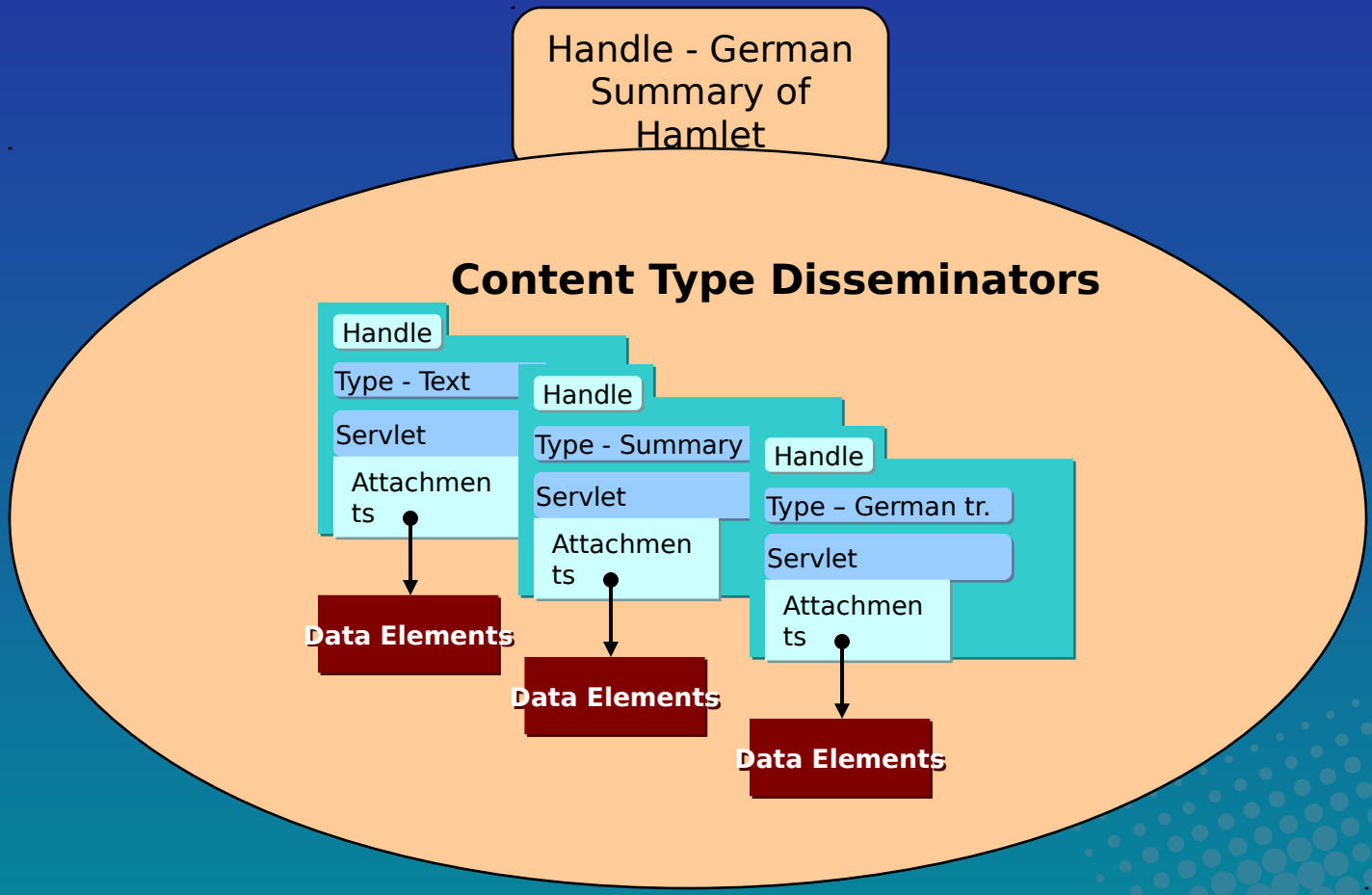
Digital Object Chaining



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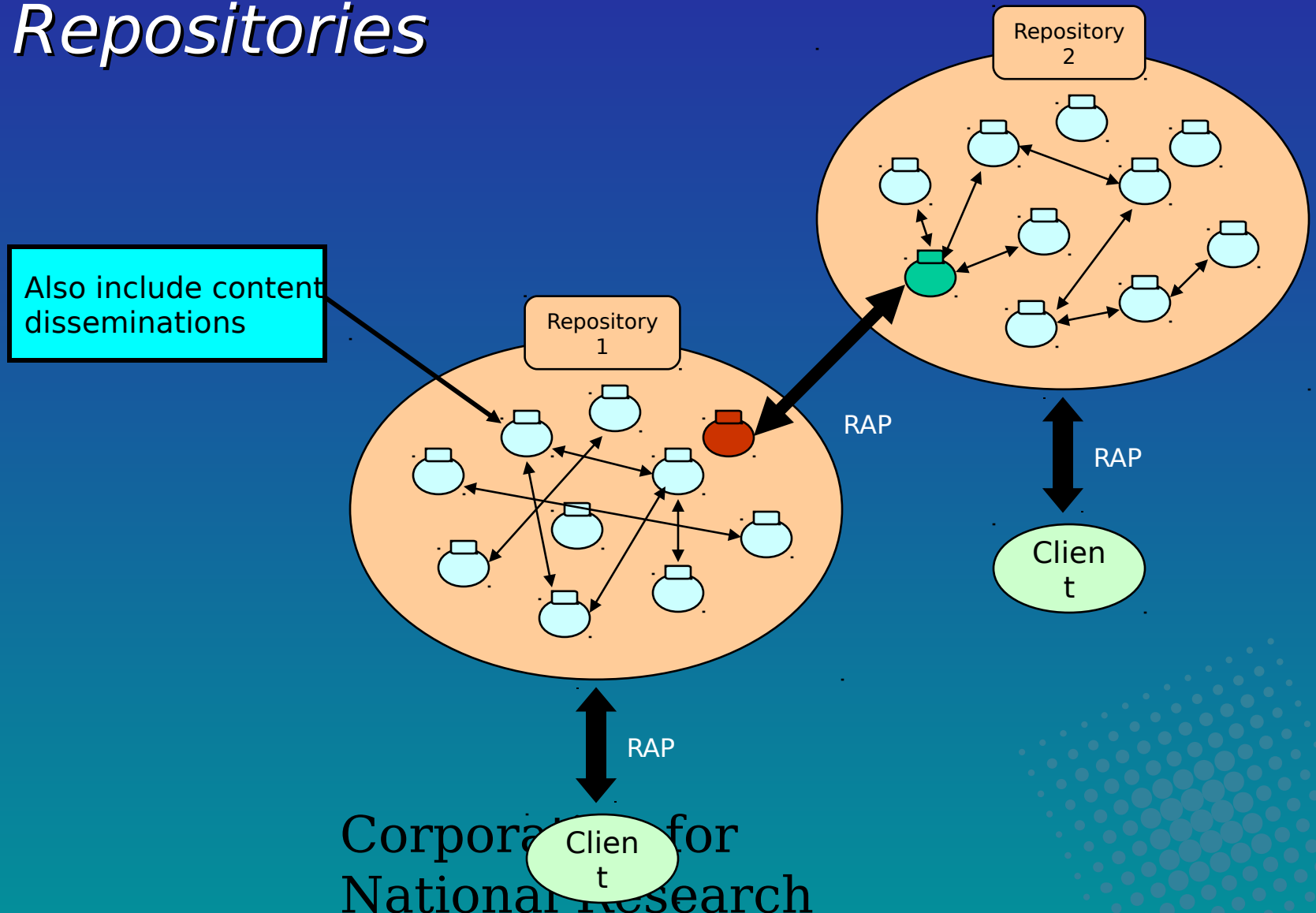
Repositories



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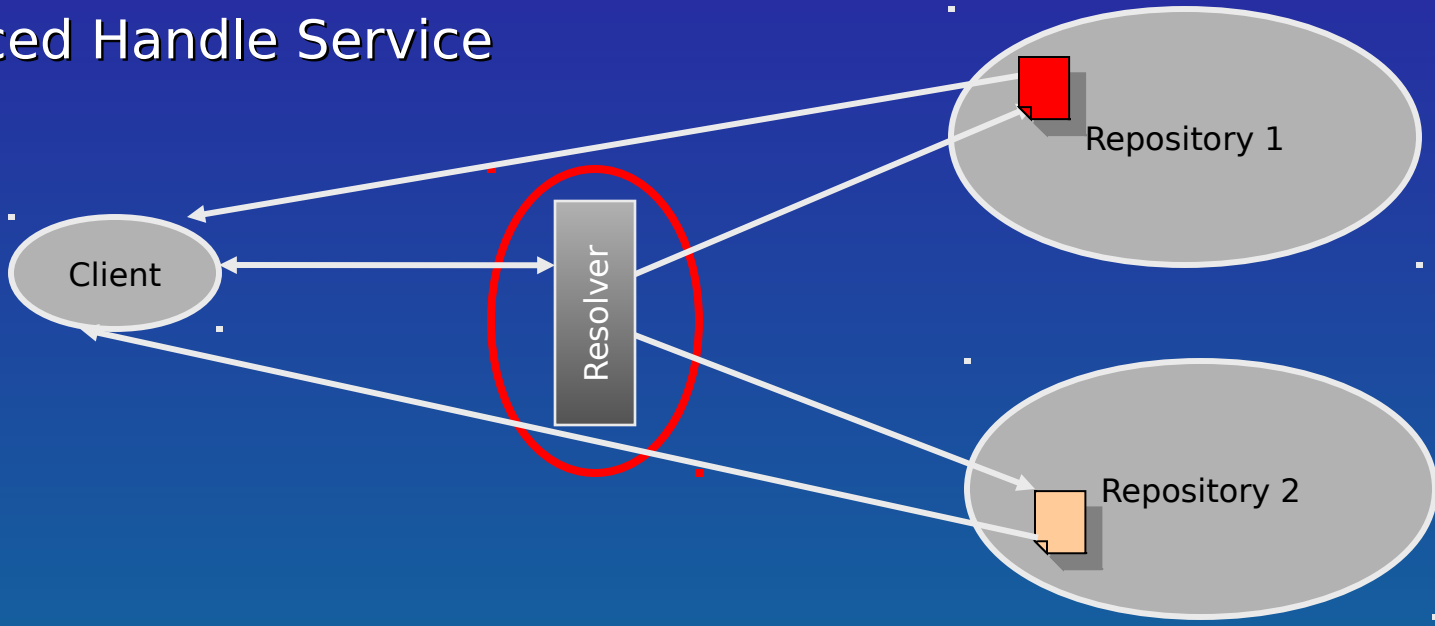
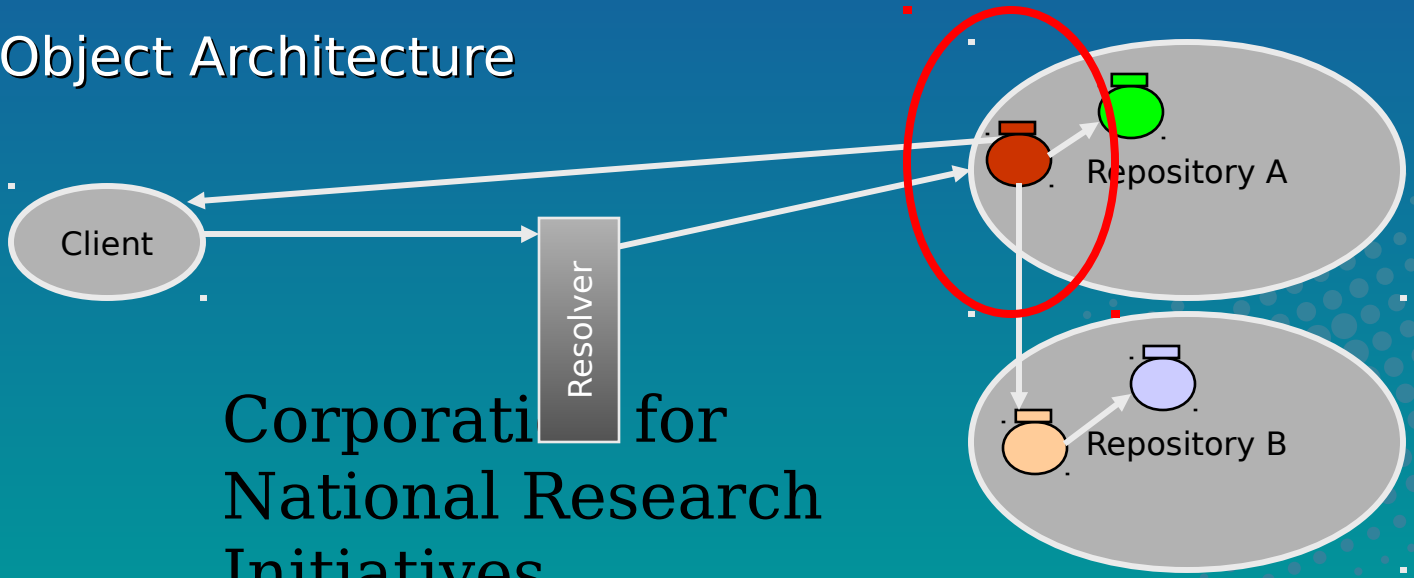
Enhanced Handle Service



Digital Object Architecture



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Digital Object Architecture Business Case

- Provides useful, authoritative, visible, and dynamic access to information
  - Encourages the innovative, value-added, dynamic and, therefore, effective use of digital information
  - Provides global visibility/coordination over information
  - Controls access to information
  - Reuses generated content, techniques, and disseminations
  - Preserves information functionality
  - Discourages generation of multiple, and potentially different, versions of information
- Provides interoperability and platform independence
- Provides greater security
  - Supports real-time access control changes
  - Supports partial dissemination

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What's Been Done

- Handles:
  - Established Handles infrastructure - CNRI
  - Established DOIs, registry agencies, and transfer mechanisms for the commercial publishing industry -- CNRI and DOI Foundation
  - Implemented the DOD Handles Service and Handles Registry for DTIC held unclassified/unlimited technical reports -- DTIC
- Digital Object Architecture:
  - Implemented a prototype Digital Object Repository, i.e. Defense Virtual Library, for technical reports, photographs, sound files, and moving images -- DTIC and CNRI
  - Successfully tested repository interoperability -- CNRI and Cornell University

Real Capability

- Handles:
  - Handles reference from STINET
    http://stinet.dtic.mil/str/index.html
  - Handles reference from Naval Postgraduate School
    http://library.nps.navy.mil/home/distance.htm
  - Handles Registry
    http://hdl.dtic.mil/wobin/WebObjects/Handles
- Digital Object Architecture
  - Defense Virtual Library
    http://dvl.dtic.mil/

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What Needs to be Done

- Implement an expanded Handles Service
  - Provide persistent identification of and access to public release and limited information
  - Provide multiple Handle resolution
  - Partnership with other government organizations to provide persistent identification of digital information

Get persistent control over government information!!!

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What Needs to be Done

- Implement Digital Object Architecture
  - Demonstrate capabilities and benefits of the Digital Object Architecture in a **real world** environment, e.g. R&D Life Cycle documents, conference proceedings, STI, complex documents, FMRs, Directives and Instructions, and FAR/DFAR
  - Demonstrate integrated access to multiple information repositories
  - Develop robust, reusable access control disseminators
  - Develop digital object based preservation strategies
  - Develop a metadata registry to support cross-repository information discovery

Interested in Partnering with DTIC?

- Contact
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